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(11) **EP 1 384 414 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
28.01.2004 Bulletin 2004/05

(51) Int Cl.7: **A45C 5/14, A45C 13/36**

(21) Application number: **02255193.1**

(22) Date of filing: **25.07.2002**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Kuwayama, Osamu**
Aichi-gun, Aichi-ken 480-11 (JP)

(74) Representative: **Harrison, David Christopher et al**
MEWBURN ELLIS
York House
23 Kingsway
London WC2B 6HP (GB)

(71) Applicant: **Sunco Luggage Co., Ltd.**
Aichi-gun, Aichi-ken 480-11 (JP)

(54) **Suitcase frame**

(57) A suitcase reinforcing frame comprises a bottom plate (1), a top plate (3), a back plate (2), and, optionally, two side plates (4,4'). Preferably the top plate and the back plate are made integrally. The base plate

preferably includes a base rib (1b) extending across the base plate (1), a perimeter rib (1a) extending around the perimeter of said base plate (1) and a plurality of corner ribs (1c) for reinforcing the corners of the perimeter rib.

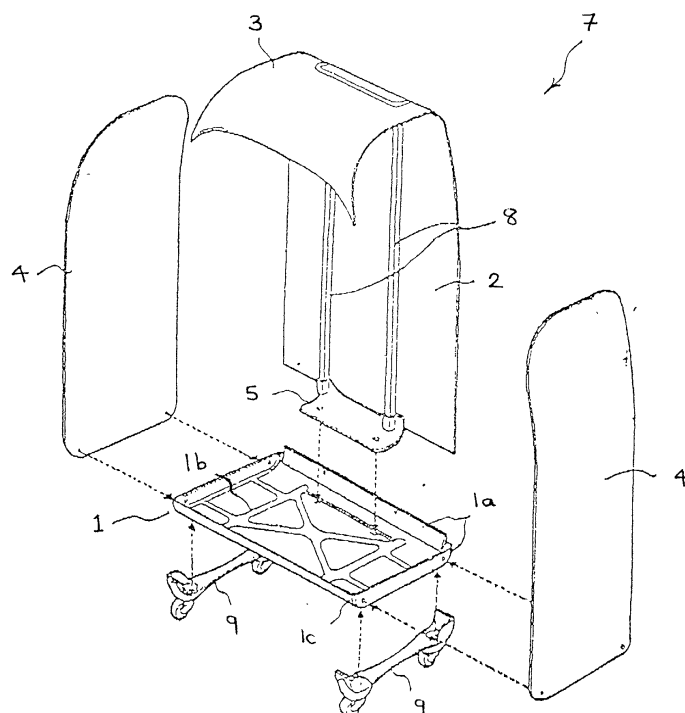


FIG.1

Description

[0001] The present invention relates generally to a suitcase, and more particularly to a reinforced shell of the suitcase.

[0002] It is apparent that a suitcase must be strong in structure and light in weight. In order to enhance the structural strength of the conventional suitcase shell, the shell is provided with a reinforcing frame 50, as shown in Figure 7. The reinforcing frame 50 of the prior art is made of a bent, rigid plastic sheet. The reinforcing frame 50 has a bottom portion 50a which is reinforced by a bottom plate 51. The addition of the bottom plate 51 results in an increase in thickness and weight of the bottom portion 50a of the reinforcing frame 50. However, without the reinforcing bottom plate 51, the bottom portion 50a is susceptible to deformation by the weight of articles held in the interior of the suitcase. It is readily appreciated that the deformed bottom portion 50a can seriously undermine the overall stability of the suitcase, thereby making the suitcase vulnerable to overturning.

[0003] One aim of the present invention is to provide a reinforcing frame which ameliorates the problems associated with the prior art reinforcing frame described above.

[0004] Accordingly, in a first aspect, there is provided a reinforcing frame for a suitcase, said frame comprising a back plate, a top plate and a base plate, the top and base plate being opposed and the back plate extending between the edges thereof, the frame characterized in that said base plate has at least one reinforcing rib.

[0005] By providing at least one reinforcing rib, the base plate can be made sufficiently strong to support the weight of the articles in the suitcase but the weight of the base plate is not significantly increased.

[0006] Preferably, the reinforcing rib is a perimeter rib extending around and, preferably, upstanding from the perimeter of the base plate. The perimeter rib may be a single rib extending around the entire perimeter or, alternatively, it may be a plurality of single ribs extending along each side of the plate and meeting at the corners of the plate. In either case, preferably there is provided at least one corner rib for reinforcing at least one corner of the perimeter rib (when the rib is a single element) or strengthening a join between two perimeter ribs (when the perimeter rib is not a single element).

[0007] Alternatively or additionally, the reinforcing rib may be a base rib extending at least partially across and, preferably, upstanding from the base plate. The base rib preferably extends from the perimeter rib. Most preferably, the base rib comprises a plurality of strands, some of which extend diagonally across the base plate.

[0008] In some embodiments, the base plate may be formed solely by the reinforcing rib(s), i.e. the base plate contains apertures defined by the rib(s) rather than being a solid plate with ribs extending across its surface.

[0009] In some embodiments, the back plate and top plate are integral.

[0010] In other embodiments, the top plate is separate from the back plate.

[0011] The top plate may include at least one strengthening rib extending across and, preferably, upstanding from the top plate. At least one edge of the top plate may be curved towards the base plate.

[0012] Preferably, the base plate further includes a wheel frame for housing wheels.

[0013] In especially preferred embodiments, the reinforcing frame further comprises two side plates, the side plates being opposed to one another and extending between the top plate and the base plate and being substantially perpendicular to the back plate.

[0014] In a second aspect there is provided a suitcase comprising a reinforcing frame according to the first aspect and a shell surrounding the frame.

[0015] The features and the advantages of the present invention will be more readily understood upon deliberation of the following detailed description of preferred embodiments of the present invention with reference to the accompanying drawings in which:

Figure 1 shows an exploded view of a reinforcing frame of a first preferred embodiment of the present invention;

Figure 2 shows a perspective view of the reinforcing frame of the first preferred embodiment of the present invention;

Figure 3 shows a schematic view of the front side of a suitcase which is reinforced by the reinforcing frame of the first preferred embodiment of the present invention;

Figure 4 shows a schematic view of the back side of the suitcase shown in Figure 3;

Figure 5 shows an exploded view of a reinforcing frame of a second preferred embodiment of the present invention;

Figure 6 shows a perspective view of the reinforcing frame of the second preferred embodiment of the present invention; and

Figure 7 shows a perspective view of a reinforcing frame of the prior art.

[0016] As shown in Figures 1-4, a reinforcing frame 7 of the first preferred embodiment of the present invention is used to construct the suitcase 10. The suitcase 10 is of a rectangular construction. The shell of the suitcase 10 is made of a cloth or plastic material. The shell of the suitcase 10 has a top portion, a bottom portion and two side portions. The top portion is provided with a handle 11. The back portion is provided with a retractable pull rod 8. The front portion of the suitcase 10 is provided with a cover 13 having a zipper opening.

[0017] The reinforcing frame 7 of the first preferred embodiment of the present invention is made of a rigid plastic material and is formed of a bottom plate 1, a back plate 2, a top plate 3, a first side plate 4 and a second side plate 4'.

[0018] The base plate 1 is made by injection moulding and includes a base rib 1b and a perimeter rib 1a which is raised from the plane of the base plate 1. The perimeter rib 1a is provided at each corner with a corner rib 1c.

[0019] The base plate 1 is provided on its underside with two wheel frames 9 which support wheels for facilitating movement of the suitcase.

[0020] The back plate 2 is fastened at its lower end to the base plate 1.

[0021] The retractable pull rod 8 is fastened at its lower end with the base plate 1 by means of a fastening piece 5 such that the upper end of the pull rod 8 protrudes from the top plate 3, as shown in Figure 4.

[0022] The two side plates 4,4' are fastened at their lower ends with the sides of the base plate 1.

[0023] The method of mounting the reinforcing frame 7 in the suitcase 10 is not the subject matter of the present invention.

[0024] The perimeter rib 1a, base rib 1b and corner ribs 1c of the base plate 1 of the first preferred embodiment of the present invention serve to provide the suitcase 10 with the most effective reinforcing strength.

[0025] It must be noted here that the top plate 3 and the back plate 2 of the reinforcing frame 7 of the first preferred embodiment of the present invention are made integrally, as shown in Figure 1.

[0026] As shown in Figures 5 and 6, a reinforcing frame 7' of the second preferred embodiment of the present invention is basically similar in construction to that of the first preferred embodiment of the present invention, except that the second preferred embodiment comprises a top plate 3 which is made separately from the back plate 2 and is provided with two support ribs 3 facing downwards, and two curved portions 3 curving downwards. As the top plate 6 is reinforced by the support ribs 3 and the two curved portions 3, the back plate 2 may be reduced in thickness. Furthermore, the reinforcing frame 7' may be even devoid of the two side plates 4. The separation of the back plate 2 from the top plate 3 allows a greater design variation of the suitcase.

[0027] The embodiments of the present invention described above are to be regarded in all respects as being illustrative and nonrestrictive.

3. A reinforcing frame according to claim 2, further including at least one corner rib (1c) to reinforce at least one corner of the perimeter rib (1a).

5 4. A reinforcing frame according to any one of the preceding claims wherein said reinforcing rib is a base rib (1b) extending at least part way across the base plate (1).

10 5. A reinforcing frame according to claim 4 wherein said base rib (1b) has a plurality of strands and at least some of said strands extend diagonally across said base plate (1).

15 6. A reinforcing frame according to any one of the preceding claims, wherein said back plate (2) and said top plate (3) are integral.

20 7. A reinforcing frame according to any one of claims 1 to 5, wherein said top plate is separate from the back plate (2) and further includes at least one strengthening rib and wherein at least one edge is curved towards the base plate (1).

25 8. A reinforcing frame according to any one of the preceding claims, wherein said base plate (1) further includes a wheel frame (9) for housing wheels.

30 9. A reinforcing frame further comprising two side plates (4,4'), said side plates being opposed to one another and extending between said top plate (3) and said base plate (1) and being substantially perpendicular to the back plate (2).

35 10. A suitcase comprising a reinforcing frame according to any one of the preceding claims and a shell surrounding said frame.

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Claims

1. A reinforcing frame for a suitcase, said frame (7) comprising a back plate (2), a top plate (3) and a base plate (1), the top and base plate being opposed and the back plate (2) extending between the edges thereof, the frame **characterized in that** said base plate (1) has at least one reinforcing rib.

55 2. A reinforcing frame according to claim 1, wherein said reinforcing rib is a perimeter rib (1a) extending around the perimeter of the base plate (1).

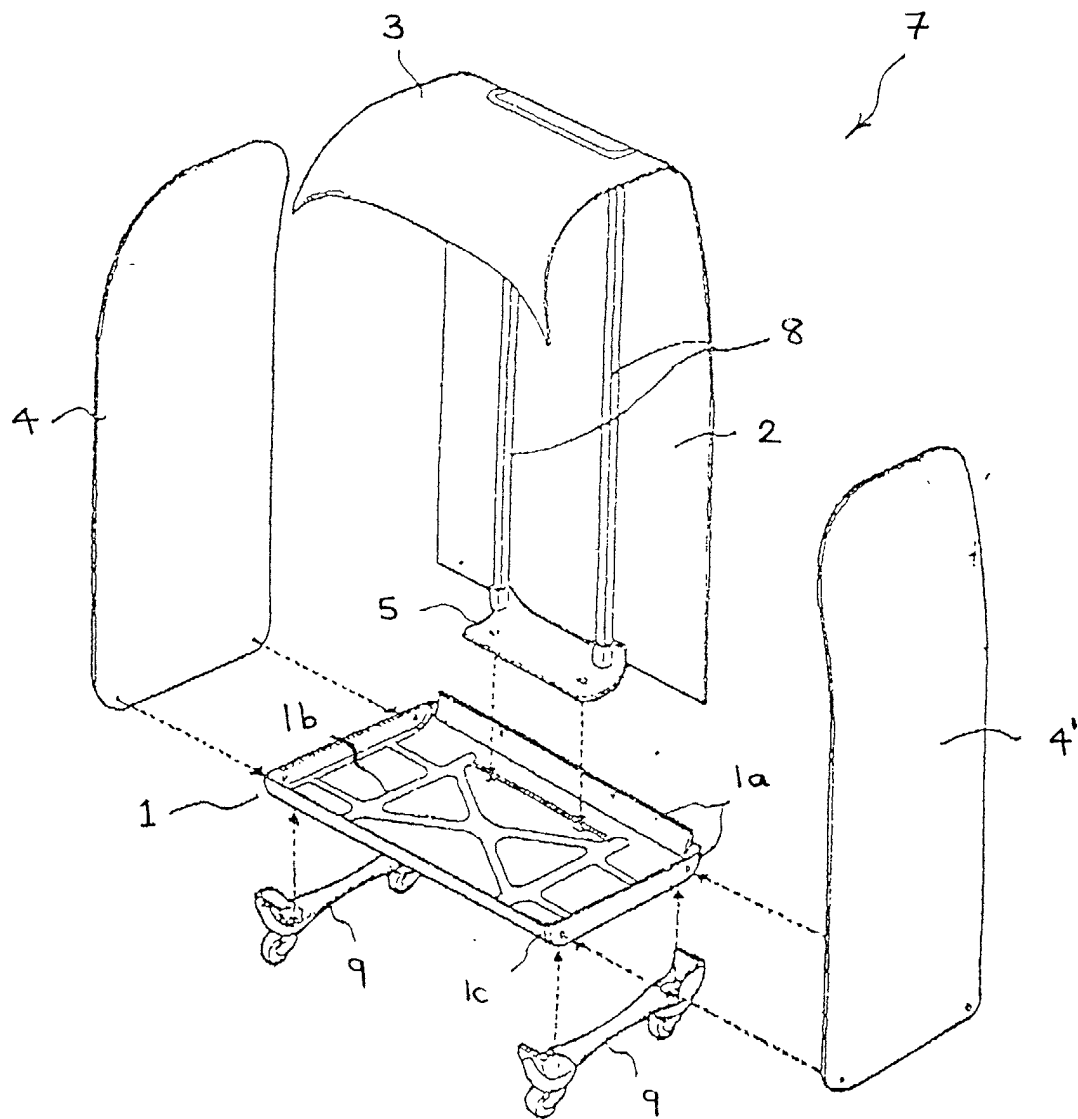


FIG.1

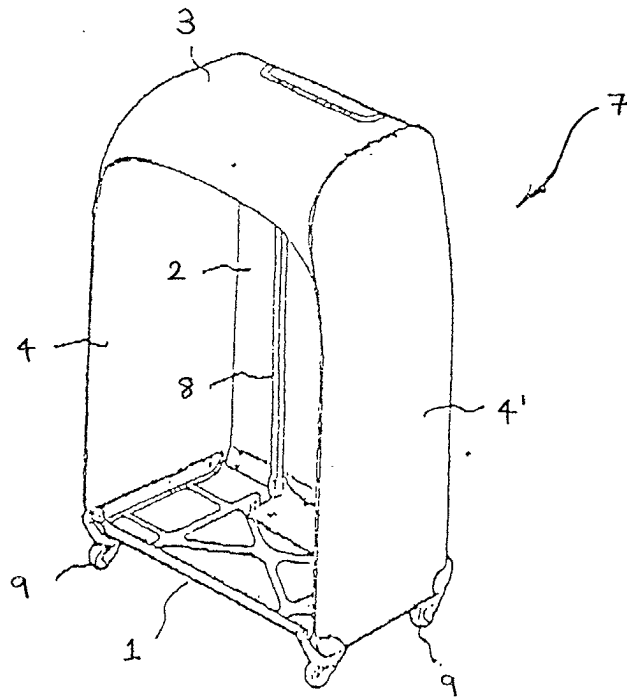


FIG. 2

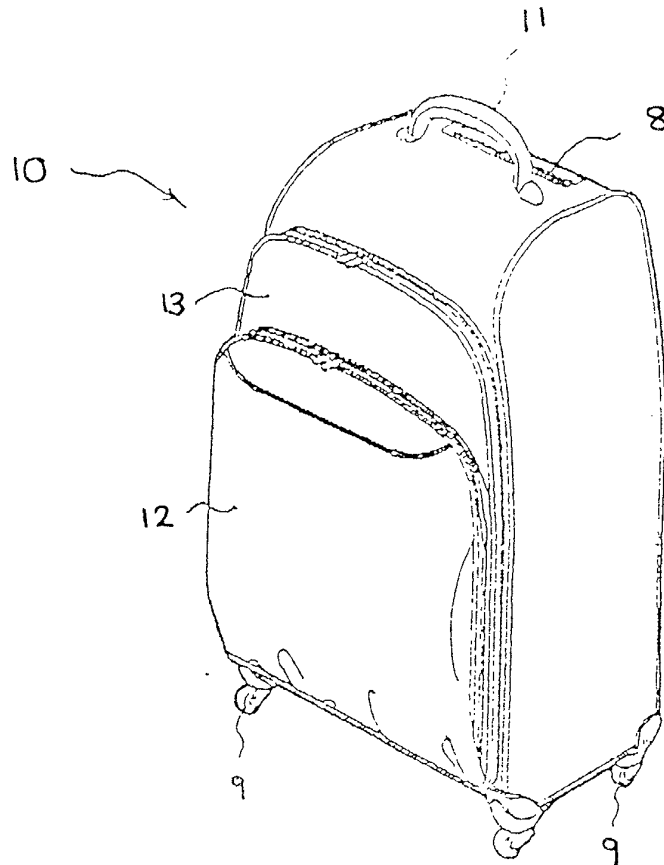


FIG. 3

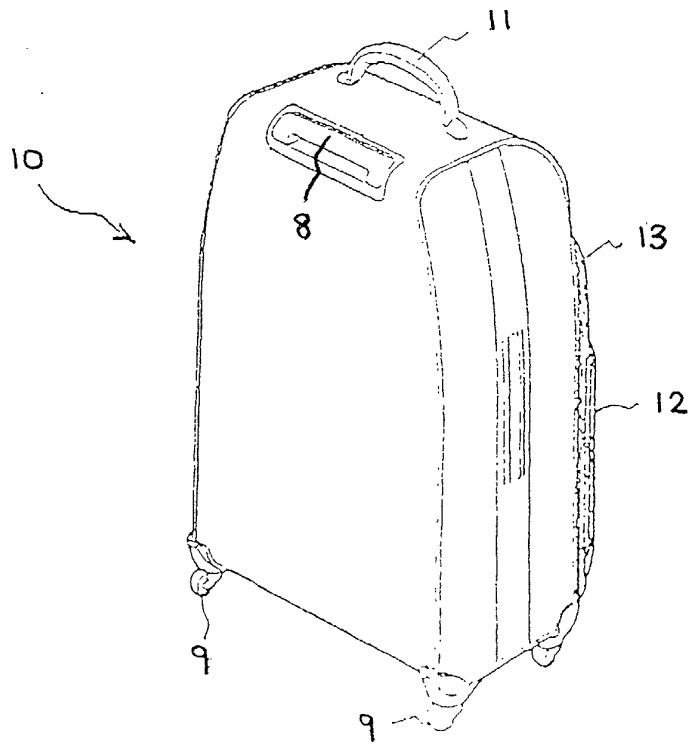


FIG. 4

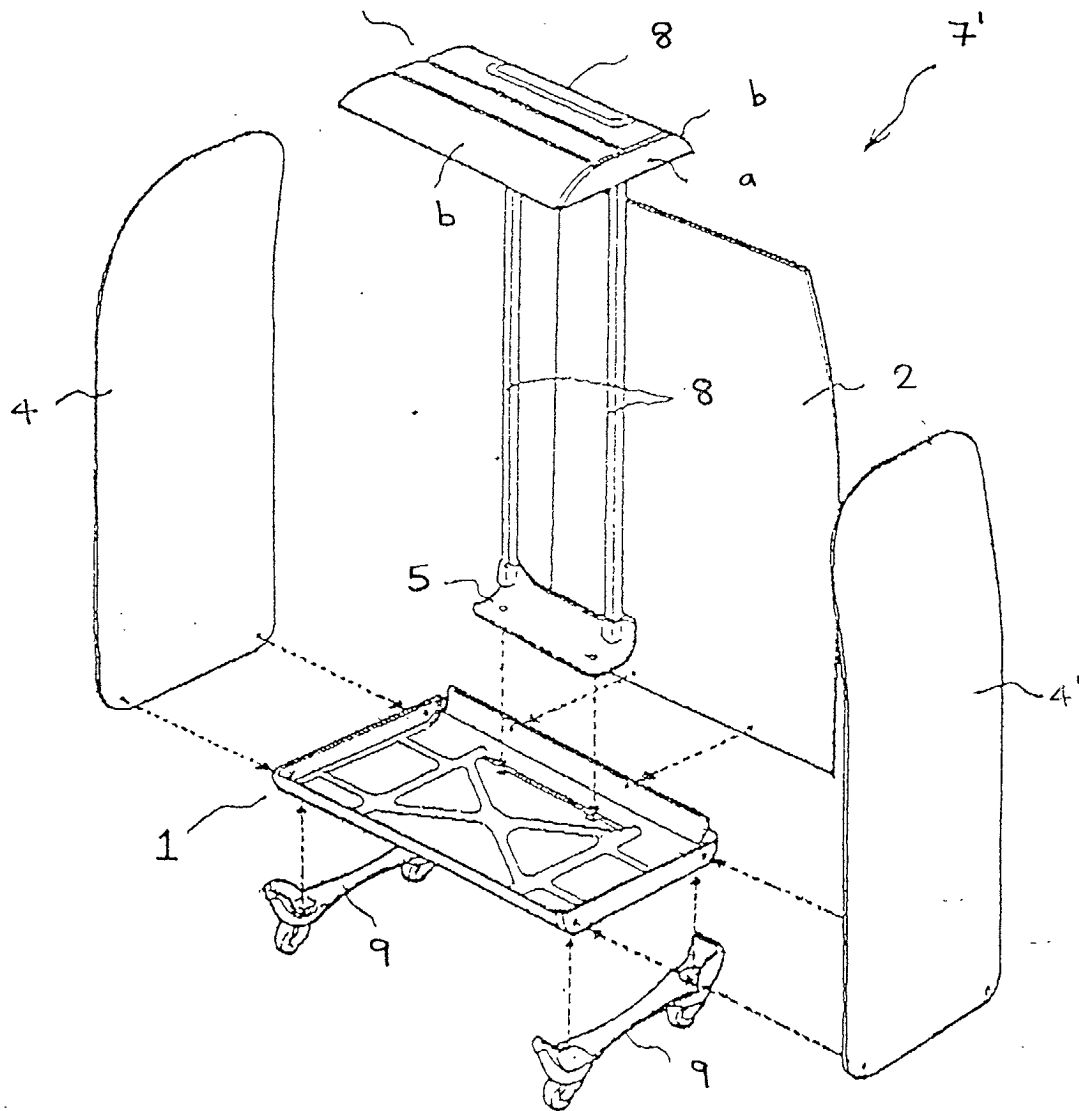


FIG.5

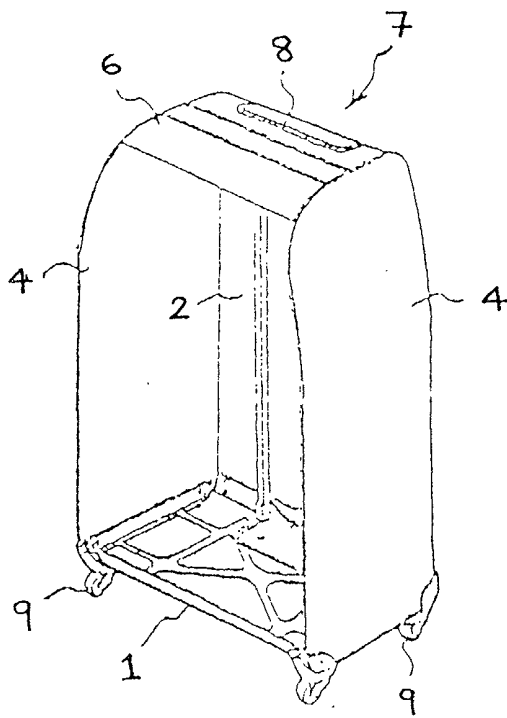


FIG. 6

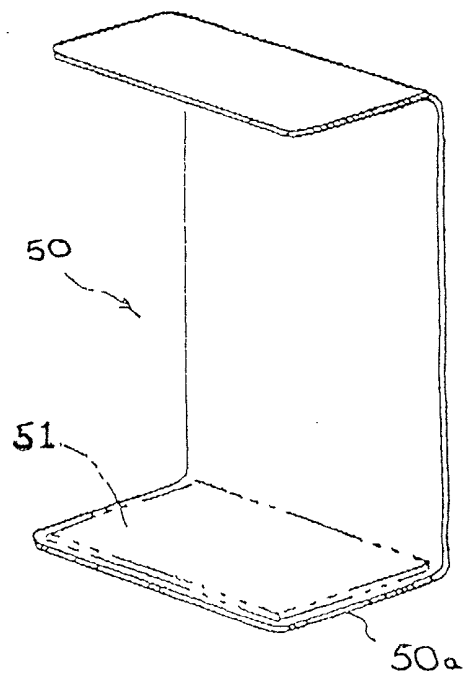


FIG. 7 PRIOR ART



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EUROPEAN SEARCH REPORT

Application Number
EP 02 25 5193

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 6 220 412 B1 (LIN SHIN-FU EIKEN) 24 April 2001 (2001-04-24) * the whole document *	1,4,6-9	A45C5/14 A45C13/36
Y	---	2,3	
A	---	5	
Y	US 6 293 569 B1 (FERRE FRANCISCO JAVIER LAZARO) 25 September 2001 (2001-09-25) * abstract; figures 2,4,6 *	2,3	
X	FR 2 775 425 A (DELSEY SOC) 3 September 1999 (1999-09-03) * abstract; figures 1-4 *	1,4,6	
X	US 5 685 403 A (MORSZECK DIETER) 11 November 1997 (1997-11-11) * abstract; figures 1-6 *	1-4,6,8,9	
X	US 5 529 156 A (YANG FU-HSIUNG) 25 June 1996 (1996-06-25) * abstract; figures 1-10 *	1,4,8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A45C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 January 2003	Examiner Garcia, J
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 25 5193

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17-01-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6220412 B1	24-04-2001	DE 19934959 A1	17-02-2000
		FR 2781346 A1	28-01-2000
		GB 2339679 A ,B	09-02-2000
		JP 2000041720 A	15-02-2000
US 6293569 B1	25-09-2001	AU 7655498 A	10-02-1999
		EP 0933037 A1	04-08-1999
		JP 2001500773 T	23-01-2001
FR 2775425 A	03-09-1999	FR 2775425 A1	03-09-1999
US 5685403 A	11-11-1997	DE 4236573 C1	21-04-1994
		DE 59307957 D1	12-02-1998
		WO 9408484 A1	28-04-1994
		EP 0665724 A1	09-08-1995
		JP 8505542 T	18-06-1996
US 5529156 A	25-06-1996	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82